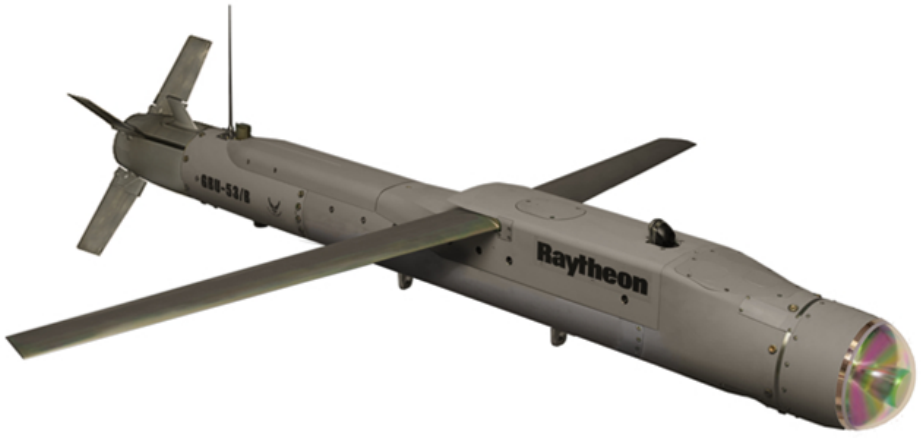
Selected Acquisition Report (SAR)

RCS: DD-A&T(Q&A)823-439



Small Diameter Bomb Increment II (SDB II)

As of FY 2015 President's Budget

Defense Acquisition Management
Information Retrieval
(DAMIR)

Report Documentation Page

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Selected Acquisition Report- SAR

14. ABSTRACT

15. SUBJECT TERMS

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unclassified	**unclassified**	**unclassified**	**Same as Report (SAR)**	**40**	

Table of Contents

Common Acronyms and Abbreviations

Acq O&M - Acquisition-Related Operations and Maintenance
APB - Acquisition Program Baseline
APPN - Appropriation
APUC - Average Procurement Unit Cost
BA - Budget Authority/Budget Activity
BY - Base Year
DAMIR - Defense Acquisition Management Information Retrieval
Dev Est - Development Estimate
DoD - Department of Defense
DSN - Defense Switched Network
Econ - Economic
Eng - Engineering
Est - Estimating
FMS - Foreign Military Sales
FY - Fiscal Year
IOC - Initial Operational Capability
$K - Thousands of Dollars
LRIP - Low Rate Initial Production
$M - Millions of Dollars
MILCON - Military Construction
N/A - Not Applicable
O&S - Operating and Support
Oth - Other
PAUC - Program Acquisition Unit Cost
PB - President's Budget
PE - Program Element
Proc - Procurement
Prod Est - Production Estimate
QR - Quantity Related
Qty - Quantity
RDT&E - Research, Development, Test, and Evaluation
SAR - Selected Acquisition Report
Sch - Schedule
Spt - Support
TBD - To Be Determined
TY - Then Year
UCR - Unit Cost Reporting

Program Information

Program Name

Small Diameter Bomb Increment II (SDB II)

DoD Component

Air Force

Joint Participants

Department of the Navy

Responsible Office

Responsible Office

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Date Assigned July 11, 2011

References

SAR Baseline (Development Estimate)

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated October 8, 2010

Approved APB

Defense Acquisition Executive (DAE) Approved Acquisition Program Baseline (APB) dated October 8, 2010

Mission and Description

Small Diameter Bomb Increment II (SDB II) is a joint interest United States Air Force (USAF) and Department of the Navy (DoN) Acquisition Category ID program, with the USAF as the lead service. SDB II provides the warfighter the capability to attack mobile targets from stand-off, through weather. The threshold aircraft for the USAF is the F-15E and the threshold aircraft for the DoN are the F-35B and F-35C. Objective aircraft include the F-16, F/A-18E/F, F-22A, F-35A, B-1B, B-2, B-52, A-10, and MQ-9. SDB II will be compatible with the Bomb Rack Unit (BRU-61) miniature munitions carriage, the CNU-660/E carriage system, the Common Munitions Bit and Reprogramming Equipment and the Joint Mission Planning System. The SDB II Program will develop and field a single USAF weapon storage container and a dual DoN weapon storage container.

Executive Summary

In 2013, the SDB II Program continued to make significant progress in design qualification, reliability growth testing, and flight testing. Raytheon Missile Systems (RMS) successfully completed eleven of twelve design verification and subsystem qualification activities, four Captive Flight Test (CFT) test series, six Controlled Test Vehicle tests, all nine Jettison Tests, a Logistics demonstration, Mission Planning module, Arena testing of the Multi-Effects Warhead, F-35B and F-35C Weapons Bay Physical Fit checks, and F-35B and F-35C Pit Ejection Testing. RMS is conducting System Environmental Qualification testing of the SDB II design and completed two critical parts in 2013: Electromagnetic Environments and Effects and Hazards of Electromagnetic Radiation to Ordnance. Reliability Growth Testing started in June 2013 and has completed over 1426 hours with the Mean Time Between Failure estimate of 253 hours (exceeding requirements). CFT testing includes 327 successful flight hours of the multi-mode seeker and Weapon Data Link against targets in various terrains, weather conditions, and with target denial and deception techniques. There have been no reliability issues from the seeker in these flight hours. To-date, the SDB II Program conducted seven Guided Test Vehicle (GTV) flight tests against moving and stationary targets with five tests being successful and two tests (GTV-2 and GTV-4) scored as mission failures. All five successful GTV flight test events were direct hits on the target. The SDB II Program team implemented corrective actions for the GTV-2 and GTV-4 failures, and successfully repeated GTV-2 (GTV-2A on October 16, 2013) and GTV-4 (GTV-4A on December 17, 2013). Verification and validation of the Integrated Flight Simulation (IFS) is underway and results from the flight tests are being used to demonstrate that the IFS accurately predicts system performance. An independent review of the manufacturing processes assessed the program at a Manufacturing Readiness Level of 8, and the program is on track for a Production Readiness Review in May 2014.

Flight test failures, time for subsequent successful retests, and delays in Environmental Qualification testing have delayed System Verification Review (SVR) and Milestone (MS) C. The RMS SVR estimate is June 2014, and the Program Manager’s best case MS C estimate is September 2014 (APB breach). F-15E Required Assets Availability is planned for January 2017 (APB threshold), and the SDB II system is on track to meet all Key Performance Parameters at fielding.

The SDB II Program Office has made significant progress on the F-35 Risk Reduction effort. The SDB II team successfully conducted F-35B and F-35C weapon’s bay fit checks utilizing production jets. Additionally, the team completed F-35C Pit testing, successfully executing 38 weapon ejection tests. The data collected during these fit checks and pit tests will be used to finalize the modification of the F-35B weapon's bay. These efforts serve as a critical risk reduction event for both the SDB II and F-35 Programs. Finally, the F-35 Joint Program Office (JPO) awarded a Universal Armament Interface (UAI) contract to Lockheed Martin (LM) on January 29, 2014. This contract will develop the logical interface for the F-35 to initialize, target and release the SDB II. This interface will be demonstrated in the F-35 software integration lab and will serve as the foundational software for the F-35 Block 4 Operational Flight Program. The SDB II will be the first weapon to integrate on the F-35 using the UAI architecture.

The SDB II Program is a $450.8M Fixed Price Incentive Firm-type Engineering and Manufacturing Development contract awarded to RMS, Tucson, Arizona on August 9, 2010. RMS will complete the design, development, weapon integration, and test for the joint interest SDB II program. F-15E integration is being accomplished by Boeing (St. Louis, Missouri) through the F-15 Development Systems Program Office using Air Force SDB II funding. The F-35B and F-35C aircraft integration contract will be awarded to LM (Fort Worth, Texas) by the F-35 Joint Strike Fighter JPO using Department of the Navy SDB II funding.

There are no significant software-related issues with this program at this time.

Threshold Breaches

APB Breaches		
Schedule		☑
Performance		☐
Cost	RDT&E	☐
	Procurement	☐
	MILCON	☐
	Acq O&M	☐
O&S Cost		☐
Unit Cost	PAUC	☐
	APUC	☐

Nunn-McCurdy Breaches		
Current UCR Baseline		
	PAUC	None
	APUC	None
Original UCR Baseline		
	PAUC	None
	APUC	None

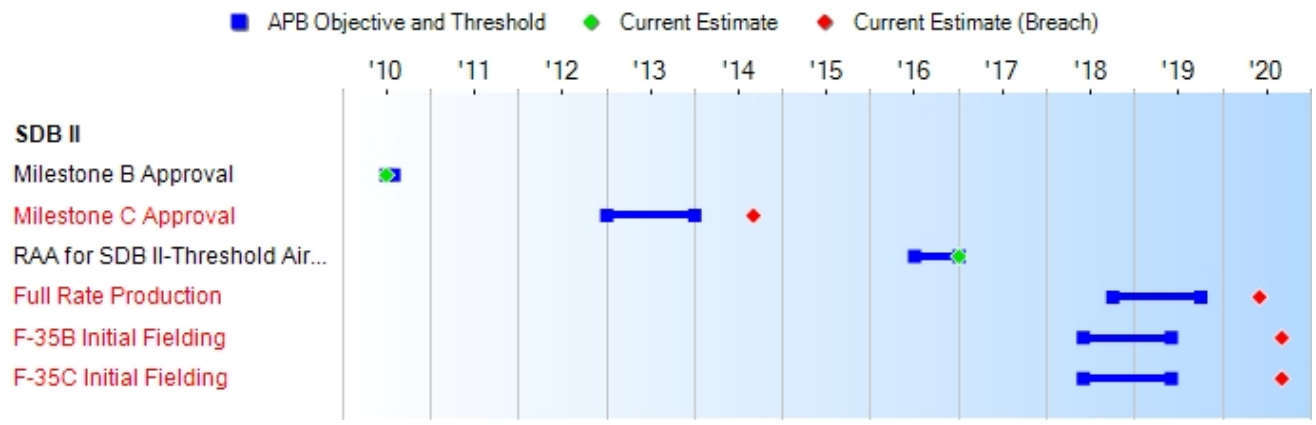
Explanation of Breach

The schedule breaches to Full Rate Production, F-35B Initial Fielding, and F-35C Initial Fielding was first reported in the December 2011 SAR.

The schedule breach to Milestone (MS) C was first reported in the December 2012 SAR.

Resolution of all breaches will be addressed at MS C.

Schedule



Milestones	SAR Baseline Dev Est	Current APB Development Objective/Threshold		Current Estimate
Milestone B Approval	JUL 2010	JUL 2010	AUG 2010	JUL 2010
Milestone C Approval	JAN 2013	JAN 2013	JAN 2014	**SEP 2014**[1] (Ch-1)
RAA for SDB II-Threshold Aircraft F-15E	JUL 2016	JUL 2016	JAN 2017	JAN 2017
Full Rate Production	OCT 2018	OCT 2018	OCT 2019	**JUN 2020**[1]
F-35B Initial Fielding	JUN 2018	JUN 2018	JUN 2019	**SEP 2020**[1]
F-35C Initial Fielding	JUN 2018	JUN 2018	JUN 2019	**SEP 2020**[1]

[1] *APB Breach*

Change Explanations

(Ch-1) System Verification Review has changed from May 2014 to June 2014 due to testing failures. Based on this change, the Program Manager's current estimate for Milestone C is no earlier than September 2014.

Memo

SDB II RAA is defined as the capability to arm twelve F-15Es with two fully loaded Bomb Rack Units (BRU-61) carriage systems each for 1.5 sorties, which equates to 144 weapons. RAA include associated spares, support equipment (including load crew trainers), initial training, mission planning capability, and verified technical orders. The ACC Commander, or applicable Major Command Commander (if first operational unit is not within ACC, will declare IOC for the Air Force at the first designated SDB II capable wing based on the wing or group commander's recommendations. The weapon configuration delivered to meet the F-15E RAA will include fully qualified hardware functionality for all required employment modes.

The Department of the Navy first unit equipped will be an F-35 squadron. The quantity of SDB II weapons required for F-35 Initial Fielding is 90 weapons and 22 carriage systems based upon a ten plane squadron with two fully loaded carriage systems each plus ten spare weapons.

Acronyms and Abbreviations

ACC - Air Combat Command
RAA - Required Assets Available

Performance

Characteristics	SAR Baseline Dev Est	Current APB Development Objective/Threshold		Demonstrated Performance	Current Estimate
Scenario Weapon Effectiveness (WE)	Given SDB II weapon delivery from an objective platform employing self targeting or an SDB II weapon delivery from a threshold or objective aircraft with third party targeting via an objective airborne platform (Paragraph 6.2.3.1.2 of CDD for SDB II dated July 28, 2009), the SDB II weapon will achieve a minimum PSSK of (OB 1) when averaged over all the target types contained in Table 6-1 of CDD for SDB II dated July 28, 2009.	Given SDB II weapon delivery from an objective platform employing self targeting or an SDB II weapon delivery from a threshold or objective aircraft with third party targeting via an objective airborne platform (Paragraph 6.2.3.1.2 of CDD for SDB II dated July 28, 2009), the SDB II weapon will achieve a minimum PSSK of (OB 1) when averaged over all the target types contained in Table 6-1 of CDD for SDB II dated July 28, 2009.	Given SDB II weapon delivery from a threshold aircraft employing self targeting or a threshold aircraft delivering SDB II with third party targeting via a JTAC, the SDB II weapon will achieve a minimum PSSK of (TH 1) when averaged over all the target types contained in Table 6-1 of CDD for SDB II dated July 28, 2009.	TBD	Given SDB Increment II weapon delivery from a threshold aircraft employing self targeting or a threshold aircraft delivering SDB Increment II with third party targeting via a JTAC, the SDB Increment II weapon will achieve a minimum PSSK of (TH 1) when averaged over all the target types contained in Table 6-1 of CDD for SDB II dated July 28, 2009.
Weapon Loadout	Four SDB II weapons integrated onto the BRU-61/A.	Four SDB II weapons integrated onto the BRU-61/A.	Four SDB II weapons integrated onto the BRU-61/A.	TBD	Four SDB Increment II weapons integrated onto the

	Aircraft will be able to carry and employ both SDB I and II weapons loaded on separate BRU-61/As during the same mission.	Aircraft will be able to carry and employ both SDB I and II weapons loaded on separate BRU-61/As during the same mission.	Aircraft will be able to carry and employ both SDB I and II weapons loaded on separate BRU-61/As during the same mission.		BRU-61/A. Aircraft will be able to carry and employ both SDB Increment I and Increment II weapons loaded on separate BRU-61/As during the same mission.
Carrier Operability (Navy Unique Requirement)	SDB II will be compatible with carrier operations without degrading other naval operations. Compatibility includes being capable of at least fifty catapult launches and forty-nine arrested landings; able to be transported, handled, stored, prepared, uploaded, and downloaded; and capable of operating in EMI, EMC, container immersion/ washdown,	SDB II will be compatible with carrier operations without degrading other naval operations. Compatibility includes being capable of at least fifty catapult launches and forty-nine arrested landings; able to be transported, handled, stored, prepared, uploaded, and downloaded; and capable of operating in EMI, EMC, container immersion/ washdown,	SDB II will be compatible with carrier operations without degrading other naval operations. Compatibility includes being capable of at least fifty catapult launches and forty-nine arrested landings; able to be transported, handled, stored, prepared, uploaded, and downloaded; and capable of operating in EMI, EMC, container immersion/ washdown,	TBD	SDB Increment II will be compatible with carrier operations without degrading other naval operations. Compatibility includes being capable of at least fifty catapult launches and forty-nine arrested landings; able to be transported, handled, stored, prepared, uploaded, and downloaded; and capable of operating in EMI, EMC, container immersion/

	salt fog/salt spray, explosive atmosphere, mechanical shock (i.e., near-miss, catapult launches/ arrested landings, and handling shock), acoustic noise, vibration, fluid contaminat-ion, corrosive atmosphere, fungus, humidity, ice, and rain environments of aircraft carrier and replenish-ment ship operations.	salt fog/salt spray, explosive atmosphere, mechanical shock (i.e., near-miss, catapult launches/ arrested landings, and handling shock), acoustic noise, vibration, fluid contaminat-ion, corrosive atmosphere, fungus, humidity, ice, and rain environments of aircraft carrier and replenish-ment ship operations.	salt fog/salt spray, explosive atmosphere, mechanical shock (i.e., near-miss, catapult launches/ arrested landings, and handling shock), acoustic noise, vibration, fluid contaminat-ion, corrosive atmosphere, fungus, humidity, ice, and rain environments of aircraft carrier and replenish-ment ship operations.		washdown, salt fog/salt spray, explosive atmosphere, mechanical shock (i.e., near-miss, catapult launches/ arrested landings, and handling shock), acoustic noise, vibration, fluid contamin-ation, corrosive atmosphere, fungus, humidity, ice, and rain environ-ments of aircraft carrier and replenish-ment ship operations.
Materiel Availability	Once 3,000 SDB II weapons are in the inventory, the Materiel Availability for SDB II will be no less than .95.	Once 3,000 SDB II weapons are in the inventory, the Materiel Availability for SDB II will be no less than .95.	The Materiel Availability for SDB II will follow this graduated scale: Greater than 500 weapons in inventory - no less than .75 Greater than 1000 weapons in inventory - no less than .80	TBD	The Materiel Availability for SDB II will follow this graduated scale: Greater than 500 weapons in inventory - no less than .75 Greater than 1000 weapons in inventory - no less than .80

			Greater than 3000 weapons in inventory - no less than .90.		Greater than 3000 weapons in inventory - no less than .90.
Net Ready	The capability, system, and/or service must fully support execution of all operational activities and information exchanges identified in the DoD Enterprise Architecture and solution architectures based on integrated DoDAF content, and must satisfy the technical requirements for transition to Net-Centric military operations to include 1) Solutions architecture products compliant with DoD Enterprise Architecture based on integrated DoDAF content, including specified	The capability, system, and/or service must fully support execution of all operational activities and information exchanges identified in the DoD Enterprise Architecture and solution architectures based on integrated DoDAF content, and must satisfy the technical requirements for transition to Net-Centric military operations to include 1) Solutions architecture products compliant with DoD Enterprise Architecture based on integrated DoDAF content, including specified	The capability, system, and/or service must fully support execution of joint critical operational activities and information exchanges identified in the DoD Enterprise Architecture and solution architectures based on integrated DoDAF content, and must satisfy the technical requirements for transition to Net-Centric military operations to include: 1) Solutions architecture products compliant with DoD Enterprise Architecture based on integrated DoDAF content, including specified	TBD	The capability, system, and/or service must fully support execution of joint critical operational activities and information exchanges identified in the DoD Enterprise Architecture and solution architectures based on integrated DoDAF content, and must satisfy the technical requirements for transition to Net-Centric military operations to include 1) Solutions architecture products compliant with DoD Enterprise Architecture based on integrated DoDAF content, including specified

	operationally effective information exchanges 2) Compliant with Net-Centric Data Strategy and Net-Centric Services Strategy, and the principles and rules identified in the DoD IEA, excepting tactical and non-IP communicat-ions 3) Compliant with GIG Technical Guidance to include IT Standards identified in the TV-1 and implement-ation guidance of GESPs, necessary to meet all operational requirements specified in the DoD Enterprise Architecture and solution architecture views 4) Information assurance requirements including availability, integrity,	operationally effective information exchanges 2) Compliant with Net-Centric Data Strategy and Net-Centric Services Strategy, and the principles and rules identified in the DoD IEA, excepting tactical and non-IP communicat-ions 3) Compliant with GIG Technical Guidance to include IT Standards identified in the TV-1 and implement-ation guidance of GESPs, necessary to meet all operational requirements specified in the DoD Enterprise Architecture and solution architecture views 4) Information assurance requirements including availability, integrity,	operationally effective information exchanges 2) Compliant with Net-Centric Data Strategy and Net-Centric Services Strategy, and the principles and rules identified in the DoD IEA, excepting tactical and non-IP communicat-ions 3) Compliant with GIG Technical Guidance to include IT Standards identified in the TV-1 and implement-ation guidance of GESPs necessary to meet all operational requirements specified in the DoD Enterprise Architecture and solution architecture views 4) Information assurance requirements including availability, integrity,		operationally effective information exchanges 2) Compliant with Net-Centric Data Strategy and Net-Centric Services Strategy, and the principles and rules identified in the DoD IEA, excepting tactical and non-IP comm-unications 3) Compliant with GIG Technical Guidance to include IT Standards identified in the TV-1 and implement-ation guidance of GESPs necessary to meet all operational requirements specified in the DoD Enterprise Architecture and solution architecture views 4) Information assurance requirements including availability, integrity,

	authenticat-ion, confidential-ity, and non-repudiation, and issuance of an ATO by the DAA, and 5) Supportabil-ity requirements to include SAASM, Specturm and JTRS require-ments.	authenticat-ion, confidential-ity, and non-repudiation, and issuance of an ATO by the DAA, and 5) Supportabil-ity requirements to include SAASM, Specturm and JTRS require-ments.	authenticat-ion, confidential-ity, and non-repudiation, and issuance of an IATO or ATO by the DAA, and 5) Supportabil-ity requirements to include SAASM, Specturm and JTRS require-ments.		authenti-cation, confi-dentiality, and non-repudiation, and issuance of an IATO or ATO by the DAA, and 5) Support-ability require-ments to include SAASM, Spectrum and JTRS require-ments.
Weapon Effectiveness	Given meeting the threshold of WE the SDB II will achieve a minimum PSSK of (OB 3), when averaged over various environment-al/ threat condition cases listed in Appendix F of CDD for SDB II dated July 28, 2009.	Given meeting the threshold of WE the SDB II will achieve a minimum PSSK of (OB 3), when averaged over various environment-al/ threat condition cases listed in Appendix F of CDD for SDB II dated July 28, 2009.	SDB II will achieve a minimum PSSK of (TH 3) for each target type (Table 6-1 of CDD for SDB II dated July 28, 2009) in each environment-al/ threat condition case listed in Appendix F of CDD for SDB II dated July 28, 2009.	TBD	SDB Increment II will achieve a minimum PSSK of (TH 3) for each target type (Table 6-1 of CDD for SDB II dated July 28, 2009) in each environ-mental/ threat condition case listed in Appendix F of CDD for SDB II dated July 28, 2009.

Requirements Source

Miniature Munitions Capability (MMC) Operational Requirements Document (ORD) dated April 8, 2005 and SDB II Capability Development Document (CDD) dated July 28, 2009

Change Explanations

None

Memo

Regarding Scenario WE, threshold aircraft is defined as F-15E for the United States Air Force (USAF) and the F-35B and F-35C for Department of Navy. Program schedule for the USAF will not be delayed due to availability of the F-35B and F-35C. Both targeting methods (threshold aircraft or Joint Terminal Attack Controller) must be employed in any combination to achieve an average over-the-target set.

Acronyms and Abbreviations

ATO - Authorization To Operate
BRU - Bomb Rack Unit
CDD - Capability Development Document
DAA - Designated Accrediting Authority
DoDAF - Department of Defense Architecture Framework
EMC - Electromagnetic Compatibility
EMI - Electromagnetic Interference
GESP - GIG Enterprise Service Profiles
GIG - Global Information Grid
i.e. - that is
IATO - Interim Approval to Operate
IEA - Information Enterprise Architecture
IP - Internet Protocol
IT - Information Technology
JTAC - Joint Terminal Attack Controller
JTRS - Joint Tactical Radio System
OB - Objective
PSSK - Probability of Single Shot Kill
SAASM - Selective Availability / Anti-Spoofing Module
TH - Threshold
TV-1 - Technical View - 1

Track to Budget

RDT&E

Appn		BA	PE
Navy	1319	05	0604329N
	Project		**Name**
	3072		Small Diameter Bomb
Air Force	3600	05	0604329F
	Project		**Name**
	5191		Small Diameter Bomb Increment II

Procurement

Appn		BA	PE
Navy	1507	02	0204162N
	Line Item		**Name**
	223800		Small Diameter Bomb
Air Force	3020	02	0207327F
	Line Item		**Name**
	SDB000		Small Diameter Bomb

This SAR reflects funding for SDB II efforts only.

Cost and Funding

Cost Summary

Total Acquisition Cost and Quantity

Appropriation	BY2010 $M			BY2010 $M	TY $M		
	SAR Baseline Dev Est	Current APB Development Objective/Threshold		Current Estimate	SAR Baseline Dev Est	Current APB Development Objective	Current Estimate
RDT&E	1601.2	1601.2	1761.3	1552.0	1665.0	1665.0	1655.1
Procurement	2976.3	2976.3	3273.9	2031.4	3545.4	3545.4	2558.2
Flyaway	--	--	--	1749.4	--	--	2208.1
Recurring	--	--	--	1749.4	--	--	2208.1
Non Recurring	--	--	--	0.0	--	--	0.0
Support	--	--	--	282.0	--	--	350.1
Other Support	--	--	--	282.0	--	--	350.1
Initial Spares	--	--	--	0.0	--	--	0.0
MILCON	0.0	0.0	--	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	--	0.0	0.0	0.0	0.0
Total	4577.5	4577.5	N/A	3583.4	5210.4	5210.4	4213.3

Confidence Level for Current APB Cost 54% -

The Milestone (MS) B cost estimate was established using a 54% confidence level. Prior to MS B, the program completed an extensive risk reduction phase that culminated in a successful Preliminary Design Review with all technology readiness level ratings at six or higher. The estimate provides sufficient resources to execute the program under normal conditions, encountering average levels of technical, schedule, and programmatic risk. It is consistent with average resource expenditures on historical efforts of similar size, scope, and complexity.

Quantity	SAR Baseline Dev Est	Current APB Development	Current Estimate
RDT&E	163	163	163
Procurement	17000	17000	17000
Total	17163	17163	17163

Cost and Funding

Funding Summary

Appropriation and Quantity Summary
FY2015 President's Budget / December 2013 SAR (TY$ M)

Appropriation	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
RDT&E	966.4	129.9	97.7	74.4	126.8	78.8	83.7	97.4	1655.1
Procurement	2.0	36.0	70.6	111.1	130.3	166.5	244.3	1797.4	2558.2
MILCON	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Acq O&M	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
PB 2015 Total	968.4	165.9	168.3	185.5	257.1	245.3	328.0	1894.8	4213.3
PB 2014 Total	1022.6	184.6	158.4	165.4	248.2	256.5	368.6	1781.1	4185.4
Delta	-54.2	-18.7	9.9	20.1	8.9	-11.2	-40.6	113.7	27.9

Quantity	Undistributed	Prior	FY2014	FY2015	FY2016	FY2017	FY2018	FY2019	To Complete	Total
Development	163	0	0	0	0	0	0	0	0	163
Production	0	0	144	246	458	651	1045	1668	12788	17000
PB 2015 Total	163	0	144	246	458	651	1045	1668	12788	17163
PB 2014 Total	163	144	144	250	390	550	1050	1650	12822	17163
Delta	0	-144	0	-4	68	101	-5	18	-34	0

Cost and Funding

Annual Funding By Appropriation

Annual Funding TY$
3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
2006	--	--	--	--	--	--	24.7
2007	--	--	--	--	--	--	92.0
2008	--	--	--	--	--	--	139.6
2009	--	--	--	--	--	--	107.1
2010	--	--	--	--	--	--	126.5
2011	--	--	--	--	--	--	100.0
2012	--	--	--	--	--	--	138.8
2013	--	--	--	--	--	--	125.1
2014	--	--	--	--	--	--	113.3
2015	--	--	--	--	--	--	68.8
2016	--	--	--	--	--	--	32.8
2017	--	--	--	--	--	--	63.4
2018	--	--	--	--	--	--	15.5
2019	--	--	--	--	--	--	15.8
2020	--	--	--	--	--	--	6.5
Subtotal	**136**	**--**	**--**	**--**	**--**	**--**	**1169.9**

Annual Funding BY$
3600 | RDT&E | Research, Development, Test, and Evaluation, Air Force

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2010 $M	Non End Item Recurring Flyaway BY 2010 $M	Non Recurring Flyaway BY 2010 $M	Total Flyaway BY 2010 $M	Total Support BY 2010 $M	Total Program BY 2010 $M
2006	--	--	--	--	--	--	26.2
2007	--	--	--	--	--	--	95.2
2008	--	--	--	--	--	--	141.6
2009	--	--	--	--	--	--	107.2
2010	--	--	--	--	--	--	125.1
2011	--	--	--	--	--	--	97.0
2012	--	--	--	--	--	--	132.3
2013	--	--	--	--	--	--	117.2
2014	--	--	--	--	--	--	104.4
2015	--	--	--	--	--	--	62.2
2016	--	--	--	--	--	--	29.1
2017	--	--	--	--	--	--	55.2
2018	--	--	--	--	--	--	13.2
2019	--	--	--	--	--	--	13.2
2020	--	--	--	--	--	--	5.3
Subtotal	**136**	**--**	**--**	**--**	**--**	**--**	**1124.4**

Annual Funding TY$
1319 | RDT&E | Research, Development, Test, and Evaluation, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
2005	--	--	--	--	--	--	8.8
2006	--	--	--	--	--	--	11.7
2007	--	--	--	--	--	--	9.7
2008	--	--	--	--	--	--	11.1
2009	--	--	--	--	--	--	15.8
2010	--	--	--	--	--	--	7.6
2011	--	--	--	--	--	--	13.4
2012	--	--	--	--	--	--	17.9
2013	--	--	--	--	--	--	16.6
2014	--	--	--	--	--	--	16.6
2015	--	--	--	--	--	--	28.9
2016	--	--	--	--	--	--	41.6
2017	--	--	--	--	--	--	63.4
2018	--	--	--	--	--	--	63.3
2019	--	--	--	--	--	--	67.9
2020	--	--	--	--	--	--	69.9
2021	--	--	--	--	--	--	21.0
Subtotal	**27**	**--**	**--**	**--**	**--**	**--**	**485.2**

Annual Funding BY$
1319 | RDT&E | Research, Development, Test, and Evaluation, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2010 $M	Non End Item Recurring Flyaway BY 2010 $M	Non Recurring Flyaway BY 2010 $M	Total Flyaway BY 2010 $M	Total Support BY 2010 $M	Total Program BY 2010 $M
2005	--	--	--	--	--	--	9.6
2006	--	--	--	--	--	--	12.4
2007	--	--	--	--	--	--	10.0
2008	--	--	--	--	--	--	11.2
2009	--	--	--	--	--	--	15.8
2010	--	--	--	--	--	--	7.5
2011	--	--	--	--	--	--	12.9
2012	--	--	--	--	--	--	16.9
2013	--	--	--	--	--	--	15.4
2014	--	--	--	--	--	--	15.2
2015	--	--	--	--	--	--	25.9
2016	--	--	--	--	--	--	36.6
2017	--	--	--	--	--	--	54.7
2018	--	--	--	--	--	--	53.6
2019	--	--	--	--	--	--	56.3
2020	--	--	--	--	--	--	56.9
2021	--	--	--	--	--	--	16.7
Subtotal	**27**	**--**	**--**	**--**	**--**	**--**	**427.6**

Annual Funding TY$
1507 | Procurement | Weapons Procurement, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
2017	90	15.5	1.0	--	16.5	7.7	24.2
2018	750	83.1	3.0	--	86.1	7.5	93.6
2019	750	85.4	2.7	--	88.1	7.4	95.5
2020	750	89.9	2.8	--	92.7	5.6	98.3
2021	750	89.9	6.0	--	95.9	5.4	101.3
2022	750	89.9	9.3	--	99.2	5.1	104.3
2023	750	89.9	12.7	--	102.6	4.8	107.4
2024	410	50.8	2.6	--	53.4	4.7	58.1
Subtotal	**5000**	**594.4**	**40.1**	**--**	**634.5**	**48.2**	**682.7**

Annual Funding BY$
1507 | Procurement | Weapons Procurement, Navy

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2010 $M	Non End Item Recurring Flyaway BY 2010 $M	Non Recurring Flyaway BY 2010 $M	Total Flyaway BY 2010 $M	Total Support BY 2010 $M	Total Program BY 2010 $M
2017	90	13.2	0.9	--	14.1	6.6	20.7
2018	750	69.6	2.5	--	72.1	6.3	78.4
2019	750	70.1	2.2	--	72.3	6.1	78.4
2020	750	72.3	2.3	--	74.6	4.5	79.1
2021	750	70.9	4.7	--	75.6	4.3	79.9
2022	750	69.5	7.3	--	76.8	3.9	80.7
2023	750	68.2	9.6	--	77.8	3.6	81.4
2024	410	37.8	1.9	--	39.7	3.5	43.2
Subtotal	**5000**	**471.6**	**31.4**	**--**	**503.0**	**38.8**	**541.8**

Annual Funding TY$
3020 | Procurement | Missile Procurement, Air Force

Fiscal Year	Quantity	End Item Recurring Flyaway TY $M	Non End Item Recurring Flyaway TY $M	Non Recurring Flyaway TY $M	Total Flyaway TY $M	Total Support TY $M	Total Program TY $M
2013	--	--	2.0	--	2.0	--	2.0
2014	144	34.4	0.5	--	34.9	1.1	36.0
2015	246	47.8	4.7	--	52.5	18.1	70.6
2016	458	75.9	5.8	--	81.7	29.4	111.1
2017	561	69.4	4.1	--	73.5	32.6	106.1
2018	295	33.3	2.9	--	36.2	36.7	72.9
2019	918	114.9	4.5	--	119.4	29.4	148.8
2020	1968	235.9	8.6	--	244.5	33.9	278.4
2021	1968	235.9	9.9	--	245.8	27.1	272.9
2022	1968	235.9	7.0	--	242.9	27.0	269.9
2023	1968	235.9	7.5	--	243.4	24.5	267.9
2024	1506	186.4	10.4	--	196.8	42.1	238.9
Subtotal	**12000**	**1505.7**	**67.9**	**--**	**1573.6**	**301.9**	**1875.5**

Annual Funding BY$
3020 | Procurement | Missile Procurement, Air Force

Fiscal Year	Quantity	End Item Recurring Flyaway BY 2010 $M	Non End Item Recurring Flyaway BY 2010 $M	Non Recurring Flyaway BY 2010 $M	Total Flyaway BY 2010 $M	Total Support BY 2010 $M	Total Program BY 2010 $M
2013	--	--	1.8	--	1.8	--	1.8
2014	144	31.0	0.5	--	31.5	0.9	32.4
2015	246	42.3	4.2	--	46.5	15.9	62.4
2016	458	65.8	5.0	--	70.8	25.5	96.3
2017	561	59.0	3.5	--	62.5	27.7	90.2
2018	295	27.8	2.4	--	30.2	30.6	60.8
2019	918	93.9	3.7	--	97.6	24.0	121.6
2020	1968	189.0	6.9	--	195.9	27.1	223.0
2021	1968	185.3	7.8	--	193.1	21.2	214.3
2022	1968	181.6	5.4	--	187.0	20.8	207.8
2023	1968	178.1	5.7	--	183.8	18.4	202.2
2024	1506	138.0	7.7	--	145.7	31.1	176.8
Subtotal	**12000**	**1191.8**	**54.6**	**--**	**1246.4**	**243.2**	**1489.6**

Low Rate Initial Production

	Initial LRIP Decision	Current Total LRIP
Approval Date	8/6/2010	8/6/2010
Approved Quantity	4034	4212
Reference	Milestone B ADM	Milestone B ADM
Start Year	2013	2014
End Year	2018	2019

The Current Total LRIP Quantity is more than 10% of the total production quantity due to the current SDB II acquisition strategy, which requires the completion of Operational Test and Evaluation (OT&E) on all three threshold aircraft prior to the Full Rate Production (FRP) decision. Since the SDB II contract award, there have been further delays to the F-35 System Development and Demonstration (SDD) program. As a result, the SDB II integration will be accomplished as a follow-on integration to the F-35 SDD. SDB II OT&E on the F-35 will not be completed by the FRP threshold of October 2019, thus delaying the FRP decision. The current approved number of LRIP weapons is 4,212, which is 25 percent of the full SDB II production quantity of 17,000 weapons. Once the F-35 Follow-on Development schedule is finalized, the SDB II LRIP quantity and APB schedule dates will be updated.

Foreign Military Sales

Due to planned integration on the Joint Strike Fighter and the F/A-18 E/F, international interest in SDB II remains high. SDB II is a Defense Exportability Features (DEF) pilot program and meetings were held on January 15, 2014 with the DEF Program Office, the Office of the Under Secretary of Defense (Acquisition, Technology, and Logistics), Office of the Director, International Cooperation and Raytheon Missile Systems (RMS). The Program Office is working with RMS to incorporate a Phase II approach for implementing design changes to support exportability requirements. The Program Office briefed the Tri-Service Committee on January 16, 2014 and a favorable decision memorandum was received on February 4, 2014.

Nuclear Costs

None

Unit Cost

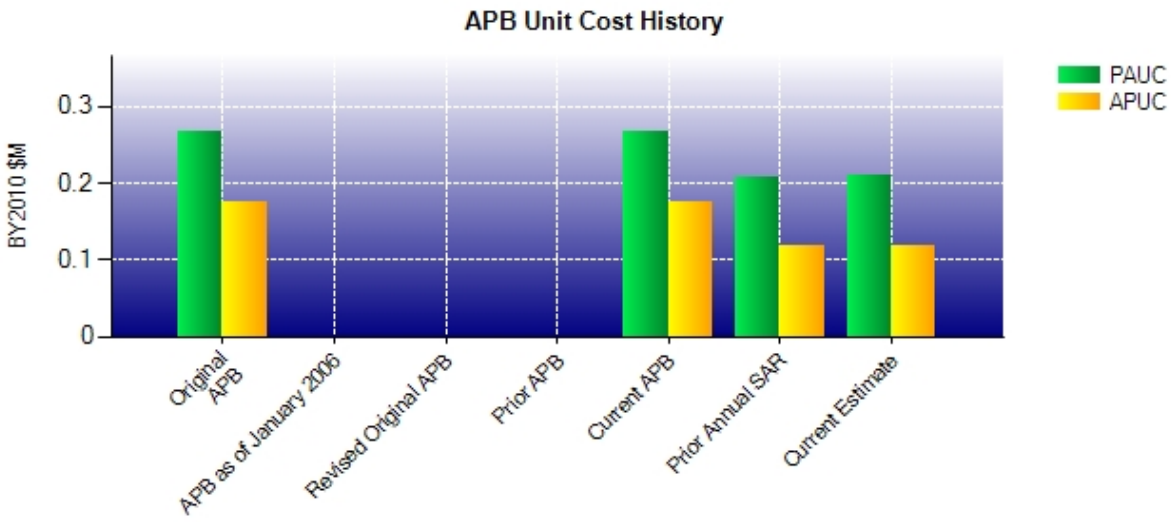
Unit Cost Report

	BY2010 $M	BY2010 $M	
Unit Cost	**Current UCR Baseline (OCT 2010 APB)**	**Current Estimate (DEC 2013 SAR)**	**BY % Change**
Program Acquisition Unit Cost (PAUC)			
Cost	4577.5	3583.4	
Quantity	17163	17163	
Unit Cost	0.267	0.209	-21.72
Average Procurement Unit Cost (APUC)			
Cost	2976.3	2031.4	
Quantity	17000	17000	
Unit Cost	0.175	0.119	-32.00

	BY2010 $M	BY2010 $M	
Unit Cost	**Original UCR Baseline (OCT 2010 APB)**	**Current Estimate (DEC 2013 SAR)**	**BY % Change**
Program Acquisition Unit Cost (PAUC)			
Cost	4577.5	3583.4	
Quantity	17163	17163	
Unit Cost	0.267	0.209	-21.72
Average Procurement Unit Cost (APUC)			
Cost	2976.3	2031.4	
Quantity	17000	17000	
Unit Cost	0.175	0.119	-32.00

The current estimate incorporates savings from actual contract option pricing and realization of efficiencies gained through competition.

Unit Cost History



		BY2010 $M		TY $M	
	Date	PAUC	APUC	PAUC	APUC
Original APB	OCT 2010	0.267	0.175	0.304	0.209
APB as of January 2006	N/A	N/A	N/A	N/A	N/A
Revised Original APB	N/A	N/A	N/A	N/A	N/A
Prior APB	N/A	N/A	N/A	N/A	N/A
Current APB	OCT 2010	0.267	0.175	0.304	0.209
Prior Annual SAR	DEC 2012	0.207	0.119	0.244	0.150
Current Estimate	DEC 2013	0.209	0.119	0.245	0.150

SAR Unit Cost History

Current SAR Baseline to Current Estimate (TY $M)

Initial PAUC Dev Est	Changes								PAUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.304	0.008	0.000	0.001	0.000	-0.067	0.000	-0.001	-0.059	0.245

Current SAR Baseline to Current Estimate (TY $M)

Initial APUC Dev Est	Changes								APUC Current Est
	Econ	Qty	Sch	Eng	Est	Oth	Spt	Total	
0.209	0.007	0.000	0.001	0.000	-0.065	0.000	-0.001	-0.058	0.150

SAR Baseline History

Item/Event	SAR Planning Estimate (PE)	SAR Development Estimate (DE)	SAR Production Estimate (PdE)	Current Estimate
Milestone A	N/A	N/A	N/A	N/A
Milestone B	N/A	JUL 2010	N/A	JUL 2010
Milestone C	N/A	JAN 2013	N/A	SEP 2014
IOC	N/A	JUN 2018	N/A	SEP 2020
Total Cost (TY $M)	N/A	5210.4	N/A	4213.3
Total Quantity	N/A	17163	N/A	17163
Prog. Acq. Unit Cost (PAUC)	N/A	0.304	N/A	0.245

The IOC above is for the F-35B and F-35C aircraft. The F-15E Required Assets Available current estimate is January 2017.

Cost Variance

Summary Then Year $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Dev Est)	1665.0	3545.4	--	5210.4
Previous Changes				
Economic	+26.0	+132.3	--	+158.3
Quantity	--	--	--	--
Schedule	--	+14.4	--	+14.4
Engineering	--	--	--	--
Estimating	-74.3	-1095.9	--	-1170.2
Other	--	--	--	--
Support	--	-46.4	--	-46.4
Subtotal	-48.3	-995.6	--	-1043.9
Current Changes				
Economic	-7.6	-13.2	--	-20.8
Quantity	--	--	--	--
Schedule	--	-2.9	--	-2.9
Engineering	--	--	--	--
Estimating	+46.0	-2.4	--	+43.6
Other	--	--	--	--
Support	--	+26.9	--	+26.9
Subtotal	+38.4	+8.4	--	+46.8
Total Changes	-9.9	-987.2	--	-997.1
CE - Cost Variance	1655.1	2558.2	--	4213.3
CE - Cost & Funding	1655.1	2558.2	--	4213.3

Summary Base Year 2010 $M				
	RDT&E	Proc	MILCON	Total
SAR Baseline (Dev Est)	1601.2	2976.3	--	4577.5
Previous Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	-26.0	--	-26.0
Engineering	--	--	--	--
Estimating	-87.0	-895.3	--	-982.3
Other	--	--	--	--
Support	--	-40.8	--	-40.8
Subtotal	-87.0	-962.1	--	-1049.1
Current Changes				
Economic	--	--	--	--
Quantity	--	--	--	--
Schedule	--	--	--	--
Engineering	--	--	--	--
Estimating	+37.8	-3.1	--	+34.7
Other	--	--	--	--
Support	--	+20.3	--	+20.3
Subtotal	+37.8	+17.2	--	+55.0
Total Changes	-49.2	-944.9	--	-994.1
CE - Cost Variance	1552.0	2031.4	--	3583.4
CE - Cost & Funding	1552.0	2031.4	--	3583.4

Previous Estimate: June 2013

RDT&E	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	-7.6
Adjustment in FY 2014 of -$2.5M for Small Buisness Innovation Research and +$8.4M for Below Threshold Reprogramming (Air Force). (Estimating)	+4.6	+4.9
Adjustment of development contract ceiling funds in FY 2015 and FY 2016 (Air Force). (Estimating)	+27.5	+30.9
Revised estimate for SDB II redesign risk due to F-35 weapons bay environment (Air Force). (Estimating)	-1.5	-1.7
FY 2014 sequestration reduction (Air Force). (Estimating)	-1.6	-1.7
FY 2014 sequestration reduction (Navy). (Estimating)	-6.0	-6.7
FY 2014 Congressional reduction (Navy). (Estimating)	-3.7	-4.0
Department of the Navy (DoN) contracted services reduction (Navy). (Estimating)	-10.3	-11.9
DoN rate adjustments (Navy). (Estimating)	-0.5	-0.5
Increase in program cost and re-phasing due to F-35 program schedule delays (Navy). (Estimating)	+26.7	+33.9
Adjustment for current and prior escalation. (Estimating)	+3.0	+3.2
Revised estimate of program office support costs (Air Force). (Estimating)	-0.4	-0.4
RDT&E Subtotal	+37.8	+38.4

Procurement	$M	
Current Change Explanations	**Base Year**	**Then Year**
Revised escalation indices. (Economic)	N/A	-13.2
Acceleration of procurement buy profile (Air Force). (Schedule)	0.0	-2.9
FY 2014 sequestration reduction (Air Force). (Estimating)	-5.6	-6.2
Reallocation of funding to reflect FY 2015 PB (Air Force). (Estimating)	+5.6	+7.0
Reallocation of funding to reflect FY 2015 PB (Navy). (Estimating)	-3.6	-3.6
Adjustment for current and prior escalation. (Estimating)	+0.5	+0.4
Adjustment for current and prior escalation. (Support)	-0.1	0.0
Increase in Other Support. Revised estimate for amount of labor required for software maintenance and updates (Air Force). (Support)	+19.8	+26.2
Increase in Other Support. Minor changes in risk estimating methodology (Navy). (Support)	+0.6	+0.7
Procurement Subtotal	+17.2	+8.4

Contracts

Appropriation: RDT&E	
Contract Name	**SDB II Engineering and Manufacturing Development**
Contractor	Raytheon Company
Contractor Location	Tucson, AZ 85756
Contract Number, Type	FA8672-10-C-0002, FPIF
Award Date	August 09, 2010
Definitization Date	August 09, 2010

Initial Contract Price ($M)			Current Contract Price ($M)			Estimated Price at Completion ($M)	
Target	Ceiling	Qty	Target	Ceiling	Qty	Contractor	Program Manager
450.8	509.9	N/A	450.8	509.9	N/A	472.8	481.9

Variance	Cost Variance	Schedule Variance
Cumulative Variances To Date (1/22/2014)	-30.9	-6.8
Previous Cumulative Variances	-20.0	-10.5
Net Change	-10.9	+3.7

Cost and Schedule Variance Explanations

The unfavorable net change in the cost variance is due to Raytheon Missile System's addition of resources to execute an aggressive test tempo leading to a System Verification Review by June 2014.

The favorable net change in the schedule variance is due to the completion status of the contract. The Engineering and Manufacturing Development contract is 78.3 percent complete and the cumulative schedule variance will continue to improve as the program makes progress towards completion.

Contract Comments

Contractor and Program Manager Price at Completion estimates do not include costs for 28 additional normal attack developmental tests inserted during Milestone B and adjustments in the F-35 Joint Strike Fighter (JSF) System Development and Design schedule. The additional test effort and F-35 JSF schedule changes were not included in the original request for proposal.

Deliveries and Expenditures

Delivered to Date	Plan to Date	Actual to Date	Total Quantity	Percent Delivered
Development	0	0	163	0.00%
Production	0	0	17000	0.00%
Total Program Quantity Delivered	0	0	17163	0.00%

Expended and Appropriated (TY $M)			
Total Acquisition Cost	4213.3	Years Appropriated	10
Expended to Date	793.3	Percent Years Appropriated	50.00%
Percent Expended	18.83%	Appropriated to Date	1134.3
Total Funding Years	20	Percent Appropriated	26.92%

The above data is current as of 2/10/2014.

The Government does not take delivery of the 163 developmental test assets.

Operating and Support Cost

SDB II

Assumptions and Ground Rules

Cost Estimate Reference:
The Air Force SDB II O&S cost estimate was completed by the Air Force Cost Analysis Agency, in support of the Milestone B decision (MS B), in May 2010. The Department of Navy O&S cost estimate was completed by the Naval Air Systems Command Cost Department Acquisition Cost Estimating Division (NAVAIR 4.2.1) in support of the MS B decision in May 2010.

Sustainment Strategy:
The SDB II O&S strategy is to use Contractor Logistics Support to cover sustainment activities for 17,000 weapons. A 20-year warranty is assumed with a 20-year shelf-life and the subsequent demilitarization of the weapon.

Antecedent Information:
SDB I (GBU-39) is not an antecedent of SDB II (GBU-53). SDB II weapon is a new acquisition program that provides Joint fighter/bomber aircraft the capability to engage mobile targets in adverse weather from stand-off ranges by utilizing a multi-mode seeker and a post-release communications weapon data link. SDB II will not replace SDB I. There is no antecedent system.

Unitized O&S Costs BY2010 $M		
Cost Element	**SDB II Average Total Inventory Cost Per Year**	**No Antecedent (Antecedent) N/A**
Unit-Level Manpower	1.700	0.000
Unit Operations	0.000	0.000
Maintenance	10.500	0.000
Sustaining Support	20.100	0.000
Continuing System Improvements	11.300	0.000
Indirect Support	1.300	0.000
Other	0.800	0.000
Total	45.700	--

Unitized Cost Comments:
Other cost element includes Government System Safety and Environmental Safety Occupational Health support and updates to the SDB II demilitarization plan. Total O&S cost is equal to the average annual total inventory cost per year times the years of weapon shelf-life, $45.7M * 20 years = $914M (BY 2010).

	Total O&S Cost $M			
	Current Development APB Objective/Threshold		Current Estimate	
	SDB II		SDB II	No Antecedent (Antecedent)
Base Year	947.0	1041.7	914.0	N/A
Then Year	1417.4	N/A	1404.6	N/A

Total O&S Costs Comments:
The current estimate is lower than the APB because the APB O&S total included disposal costs.

Disposal Costs:

The current estimate for demilitarization and disposal of SDB II weapons is $58.8M (BY 2010).